

## 論文の内容の要旨

Strategies of Multinational Enterprises on  
Research and Development Activities in China:  
A Case of Japanese and US Firms  
(中国における多国籍企業の研究開発戦略  
—日米企業の実証研究)

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Since China's open-door policy in 1978 to welcome foreign direct investments (FDIs) and multinational enterprises (MNEs), its economy has been growing in a stunning speed. Led by governmental policy reforms, China has boosted its economy since the 1990s, and has been creating a research-and-development (R&D) competitive environment in the 2000s, transforming China to a knowledge economy as the next engine to retain continuous high economic growth. Foreign MNEs recently have been lured to implement R&D activities in China beyond labor-intensive manufacturing in utilizing China's abundant R&D resources. However, along with the economic growth, regional disparity becomes a challenge, and knowledge spillover is a potential risk to foreign MNEs. They need to face these factors and to implement relatively competitive strategy in order to ensure their success of R&D in China.

By statistical analysis and field survey of the US and Japanese firms that incorporate R&D activities in China, this study intends to present the China R&D environment, as an emerging economy, to foreign MNEs. Location strategy is no longer to select a cost competitive country in the national level, but to consider both pros and cons of domestic environments in the regional level, and to understand the influence of firm nature on decision making. This study based on existing literature of MNE's R&D internationalization proposes an innovative model by using patent data embedding knowledge flows to analyze corporate strategies of firms' R&D activities. In comparison of Japanese and US R&D activities, this study differentiates their corporate strategies. It expects to provide insights for the Chinese governments to build an attractive infrastructure of international R&D activities and for MNEs to create competitive strategies on R&D activities in China.

About the methodology, this study firstly reviews the China's R&D development, and the US and Japanese R&D activities in China. It designs knowledge flow as the essential element

embedded in R&D activities to observe foreign MNEs' strategies. However, due to immeasurable property of knowledge flow, patent data that have been suggested to track knowledge flow is used for statistical analysis. Based on the selected patent data, the geographical distributions of R&D activities of the US and Japanese MNEs in China are examined. This study not only discusses the linkage of patent data and MNEs' location strategies on R&D activities, but also analyzes the location distributions of US and Japanese MNEs by using conditional logit regression. Finally, firm interviews with foreign MNEs are implemented to understand the first-hand R&D facts and to examine the statistical results.

In the analytical model, both location-level attributes (Innovation capability, industrial policy for foreign investment, availability of R&D personnel, salary level of R&D personnel, and market size) and firm-level characteristics (firm size and capital intensity) are designated for analysis on their location distribution. In the analysis, 183 sample firms (49 Japanese firms and 134 US firms in 688 patents) are selected from the USPTO (United States Patent and Trademark Office) database, and additional 184 Japanese sample firms (in 521 patents) are selected from the JPO (Japan Patent Office) database. Locational data are collected from the China Statistical Yearbooks, and firm-level data are collected from public information. Sample firms are divided by firm size and capital-intensity to estimate the impacts by selected location-specific factors. The comparison of location strategies of the US and Japanese MNEs presents another nature of firm-level characters as firm nationality.

The data show that the type of MNEs' R&D in China contains collaboration to academia and other firms beyond in-house R&D by their subsidiaries. Viewing the geographical distribution, MNEs' R&D activities tend to concentrate unevenly. US firms concentrate in Beijing, Shanghai and Guangdong. Beyond the same regions, Japanese firms also concentrate in Liaoning. Although Japanese firms show lower concentration compared to US firms, however, Japanese firms tend to cluster in the regions where Japanese firms have already been doing business.

In the statistical results, the findings are summarized about the similarities and differences on strategies of the US and Japanese firms. First, the tendency shows that larger firms in terms of firm size and capital-intensive firms prefer superior R&D personnel rather than smaller firms and non capital-intensive firms. Second, both the US and Japanese firms are significantly in proximity to locations with more R&D personnel and better quality of R&D personnel. Third, Japanese firms emphasize more on the higher availability of R&D personnel than US firms, whereas US firms emphasize more on the better quality of R&D personnel than Japanese firms.

According to the firm interviews, it is clarified that Japanese firms and US firms had implemented partially different strategies in the late 1990s when China was working on S&T policy reforms and before it became a member of World Trade Organization in 2001. Some of the reasons may be that Japanese firms faced loss of technology outflow and remained to concentrate more on obtaining R&D personnel; however, US firms started to establish large-scale R&D centers topping on the trend of China's industrial transformation, and emphasized more on collaborating with prestigious Chinese universities and recruiting superior R&D personnel.

In all, this study successfully presents China's R&D development and concludes foreign MNEs' (the US and Japanese firms) strategies on R&D activities in China with emphasis of knowledge flow and in the view from regional level. As implication, beyond the active regional policies in providing incentives to lure MNEs, the importance of availability of superior R&D personnel is highlighted by either cultivating talents in prestigious universities or recruiting from the world to academia regionally. With understanding of limitations in this study, hopefully, this study will provide insights for newcomers to enter the China market, and for Japanese firms to utilize Chinese talents for creating innovation in high-tech R&D as well as US firms do.

Keywords: strategy, multinational enterprises, location choice, knowledge spillover, China market, R&D activities, patent data, regional disparity